

BOTANICAL SCIENCE IN VICTORIA 100 YEARS AGO

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National Herbarium of Victoria

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Any attempt to discuss the state of botanical science in Victoria 100 years ago might well be introduced by some account of the attainments in this field up to, say, 1850—i.e., before the discovery of gold, and only 16 years after the first permanent settlements at Portland and Melbourne. Those pioneer settlers, needless to say, had very little time to spare for botanical pursuits, or for any other purely academic studies. What little we do know about Victorian plant life prior to 1850 comes entirely from published reports of the very few visiting British explorers and a couple of local pastoralists whose collections were all sent back to England. There was no local expert or herbarium to receive such material, and no institution in the young colony for fostering botany.

Earliest in the field was Robert Brown, friend of Sir Joseph Banks and naturalist to Captain Matthew Flinders on the *Investigator* which sailed into Port Phillip at the end of April 1802. Brown lost no opportunity to go ashore while his ship remained inside the Heads for a week; but, although he climbed Arthur's Seat, little could be found in flower so late in the autumn. He returned to Port Phillip in January 1804, and spent another week collecting in the vicinity of present-day Sorrento during the abandonment of Collins's unsuccessful attempt at settlement there. The full extent of these first botanical collections from Victorian soil is not known; but we have evidence that Brown gathered from (or noted) about 100 species, 18 of which provided him with the type material of undescribed plants.

Even more important are the gatherings of Major T. L. Mitchell, made in the W. half of Victoria, and particularly the Grampians, between June and October 1836. Professor Lindley worked up this collection in London, describing 40 out of at least 150 numbers as species new to science. Several of Mitchell's plants had already been discovered around Port Phillip Heads by Robert Brown, so that no more than 180 species accrued from the combined efforts of these investigators. Ronald C. Gunn and James Backhouse independently visited S. shores of Victoria (chiefly Port Phillip) between 1836 and 1838; a few plant specimens were taken by each, but the number has never been assessed and their effect in elucidating Victoria's flora was inconsequential.

F. M. Adamson, a settler near Melbourne from 1840 to 1855, sent plant specimens to Sir William Hooker at Kew, England. Simultaneously, J. G. Robertson built up a plant collection of 4,000 dried specimens at Casterton where he managed an early pastoral holding; they were presented to Kew Herbarium upon his return to Britain in the mid-1850's. These, apparently, were the first botanical contributions by residents within the colony, but none of their material remained here.

It is doubtful whether more than about 500 plant species had ever been collected in Victoria before 1852. During the winter of that year a youthful German migrant, Dr Ferdinand Mueller, was attracted from Adelaide to the Victorian gold-fields,

his objective being to establish a pharmaceutical business among the new diggings in Castlemaine district. Also at this time Lt-Governor LaTrobe was looking for a capable man who would act as colonial botanist and undertake a thorough survey of the country's vegetation.

Dr Mueller's enthusiasm for botany equalled, if not exceeded, his interest in chemistry. He had obtained a doctorate of philosophy at Kiel University through a treatise on the familiar weed, Shepherd's Purse (*Capsella bursa-pastoris*) and, immediately upon arrival at Adelaide in December 1847, he began to investigate the South Australian flora, journeying as far afield as Rivoli Bay to the S. and Lake Torrens in the N. The strange new plants of his adopted country held endless fascination for young Mueller who published a preliminary account of their broader features in 1850—'The Murray-serub botanically sketched'. It was to be the forerunner of some 800 papers and major works on Australian botany that flowed from his pen during the next 46 years. Although concerned with South Australia, this first small paper could apply almost equally to the Mallee areas of NW. Victoria. Queensland's greatest botanist, Frederick Manson Bailey, once paid this remarkable tribute:

1847 must, for all time, be looked upon as the great epoch of Australian botany . . . it is due to his (Mueller's) zeal in the cause, and indefatigable labour, that the way of the botanist at the present time is so plain and easy.

By the time he came to Victoria, Mueller had made a favourable impression on the leading botanical men of W. Europe, both through his writings and donations of dried material. Thus, Sir William Hooker of Kew recommended his appointment as the first full-time Colonial Botanist of Victoria, and late in January 1853 he assumed office.

From then onward the story of botanical science in Victoria became identical with the personal activities of Ferdinand Mueller; he was virtually alone in the field.

So much has already been written about his exploits, his researches, his diverse interests and extraordinary powers of application, that it would be redundant to enlarge upon them now; but one may be pardoned, perhaps, for referring to one or two notable achievements of just a century ago.

The most meagre information and equipment confronted Mueller as he began work in 1853—even the few previous collections of Victorian plants were all overseas and thus inaccessible to him. Within 6 weeks of appointment he was away exploring the unknown alpine fastnesses of Mt Buffalo and Mt Buller by packhorse; thence he crossed the intervening mountainous terrain to the Latrobe R. and Wilson's Promontory, and so back to Melbourne along the coast—a 3 months' trip of about 1,500 m. Toward the end of the same year he undertook a far more ambitious journey, covering 2,500 m. and lasting 5½ months. This was W. from Melbourne to the Grampians, across to the Avoca R. sources and down that stream almost as far as the Murray, then W. again to Lake Lalbert and through Mallee scrub to Swan Hill, down the Murray to Wentworth and then back up the river to Albury, along the Mitta Mitta to Omeo, the rugged Cobboras peaks (6,000 ft.), down the Snowy and E. across the various Gippsland rivers to Melbourne. He had by now been practically all round the colony, and what a harvest these two first journeys yielded! The combined 4,000 m. trek of 1853/54 acquainted Mueller with 1,500 species of higher Victorian plants, many being hitherto unknown to science.

August 1854 witnessed the inauguration of the Philosophical Society of Victoria, precursor to the Royal Society, and Mueller was a foundation member (later

president). The *Transactions* of this body began to appear in 1855, providing a local medium for him to describe the impressive array of botanical novelties gleaned from his explorations; but so pressing was the need for more and more descriptive work that Mueller seized upon any possible vehicle for publishing his researches—overseas journals of botany, pharmacy journals, natural history magazines, parliamentary reports, and even newspapers on gardening. At the time of his death this nestor of botany had published diagnoses for some 2,000 new species of Australian plants.

For 18 months during 1855/56 Mueller was away in the tropics as botanist to A. C. Gregory's North Australian Expedition—a venture that added further lustre to his name and a spate of plants to his private herbarium. In 1857 he not only became 3rd Director of the Melbourne Botanic Gardens, but secured a building therein to house his dried specimens which were simultaneously handed over to the Government; this step marked the beginning of Melbourne's modern State Herbarium, now embracing about 1½ million sheets of specimens.

In 1858 the collection numbered 45,000 specimens, by 1861 it had risen to 160,000, and Mueller's estimate in 1868 was of 350,000—a phenomenal achievement for one man in just 15 years' endeavour. With justifiable pride he reports thus to Parliament (30/9/1865):

It is gratifying to reflect that for independent phytographic researches now in Australia more extensive means and greater facilities exist than in many of the metropolitan institutions of an analogous tendency in Europe.

By the end of his life he had left remarkably little for succeeding field botanists to discover in Victoria; and the few mistakes he made serve only to throw his innumerable great accomplishments into sharper contrast. Two laughable 'bulls', discovered in recent years, are Mueller's description of the withered contorted flowers of an inland mallow as the fruiting structures of a new blue-bush (*Kochia* sp.), and the relatively large capsules of an ephemeral ground moss as fruits of an undescribed and unusual member of the flowering purslane family! For the sake of brevity, his earlier field labels were often written in Latin, and the habitat notes on some of these are almost lyrical, e.g. 'growing near perennial springs and irrigated by the melting snow'.

In April 1863, after just a decade in the Victorian Public Service, Mueller stated that 'the botanical investigation of the territory of our colony is now nearly completed'. But his investigations had extended far beyond Victoria, including identification of the plant collections brought back from such major expeditions as those of Leichhardt, Gregory, Stuart, Burke and Wills. Many similar assignments were to engage his attention in the succeeding three decades, as he made contacts with the remotest corners of the Continent and even the highlands of New Guinea. Apart from his critical taxonomic faculties, Mueller also looked upon vegetation through the eyes of the geographer, the forester, agriculturist and pharmacist.

He was deeply concerned to find out how plant life, native and exotic, could best be made to serve the needs of man. Thus he secured 24 kinds of timber from Wilson's Promontory for the Melbourne Exhibition of 1854, and in 1858 he published a paper 'On a general introduction of useful plants into Victoria'. Also, during 1857/58 he distributed 7,120 living plants and 22,438 packets of seed to gardens throughout the colony. Next year he introduced, among other plants, the now very widely grown and important Monterey Pine (*Pinus radiata*). Sometimes his enthusiasm for acclimatizing alien plants 'back-fired', as when in March 1862 he reported making available to various districts in Victoria the British Blackberry

'which proves to be remarkably prolific'—many bramble-ridden land-owners would now agree that, in the annals of the State, 1861 was not a year of unmixed blessing.

Mueller was absorbed with the commercial importance of eucalyptus oil, and was in close contact with Joseph Bosisto who established a factory for large-scale extraction at Western Port in 1862. He furnished barks and other parts of plants to Professor Wittstein in Munich for investigation as to their chemical and therapeutic properties. He advocated extensive planting of New Zealand flax which 100 years ago was realizing £20 a ton in London as raw material. He gave early lectures on rust in cereals, and wrote on a very wide range of economic subjects—e.g. plantations to mitigate drought, control of sand-drift, vine diseases, medicinal plants and the growth of cinchona in Victoria, poison plants, forest conservation, the potash status of soils, etc.

His departmental correspondence sometimes rose to 3,000 letters a year, in an age when typewriters and stenographers were unknown. Between 1858 and 1882 he published 94 fascicles of the *Fragmenta Phytographia Australia*, which has the distinction of being the only Australian scientific periodical ever to appear entirely in Latin. In 1861 began that fruitful collaboration with George Bentham in England which resulted in the great *Flora Australiensis*—7 volumes, completed in 1878 and still remaining the standard reference work on the vascular vegetation of the whole continent.

Mueller's botanical attainments of a century ago are even more astonishing when it is borne in mind that he was *ex officio* Director also of the Zoological Gardens; there he was expected to introduce and acclimatize animals that would benefit the country's primary industries—e.g. llamas and alpacas from South America, the wool clips of which were carefully measured and recorded.

His labours in the cause of science earned for him a hereditary barony from the King of Württemberg in 1869, and a K.C.M.G. from Queen Victoria in 1879. Thereafter he was Baron Sir Ferdinand von Mueller. Governments of 18 other countries also honoured him with knightly orders and he became a doctor 5 times over. He held membership with some 150 scientific and learned bodies throughout the world. C. R. Blackett, president of the Pharmacy Board of Victoria, spoke thus of Mueller in his obituary to the *Australasian Journal of Pharmacy*, 20/10/1896:

If Australian science is recognized in Europe, we may confidently say that it is chiefly through the labours and genius of the Baron. He was an honorary member of the Pharmaceutical Society of Australasia; he had a vast amount of knowledge in pharmacy, and nothing gave him more pleasure than the progress of pharmaceutical education.

Botanical teaching and research at the middle of last century, not only here but in Britain, was practically confined to the systematics of flowering plants and ferns—their gross morphology, taxonomic arrangement and nomenclature. Darwin's cataclysmic *Origin of Species* appeared in 1859, and his friend Sir Joseph Hooker was at once a doughty champion of evolution; but Mueller would have none of it. His sentiments are expressed in a report dated 30 September 1865:

That through want of extensive field studies, untenable limits are assigned to a vast number of supposed specific forms admits of no doubt whatever, and it is equally evident that the vain attempt to draw lines of specific demarcation between mere varieties or races . . . has largely tended to suggest the theory of transmutation, a doctrine against which . . . I have expressed, though cursory still unequivocally, a dissenting opinion.

About 1872 the illustrious trio Huxley, Dyer and Vines are said to have 'changed the face of British botany' by lecturing at the Normal School of Sciences,

South Kensington, on such neglected subjects as cryptogams, palæontology, cytology and physiology. Experimental pathology did not come into its own in Britain until the teachings of H. M. Ward from about 1880; ecology sprang into prominence under the Danish leadership of Warming from 1895; while the genetic approach in botany is even younger, stemming from about 1900 when Hugo de Vries, Correns and others introduced to the world those laws of heredity propounded by the brilliant experimenters Naudin and Mendel, who both wrote of their researches during 1865. In all these trends away from purely floristic botany, Australia has probably been slower to adopt modern disciplines and techniques than the United Kingdom.

An amusing episode from the botanical stage of early Victoria concerns one William Swainson, a visitor from New Zealand who was engaged by Lt-Governor LaTrobe in September 1852 (just prior to Dr Mueller's appointment as first colonial botanist to 'pursue investigations into the botanical character of Australian trees'; the salary was to be £350 per annum, with travelling expenses. There is no indication that Swainson and Mueller ever crossed paths (or swords), but each must have been aware of the other's activities. A year later (2/10/1853) Mr Swainson made an extraordinary report to Parliament, setting out the 'result of my botanical investigations in this province'. He claimed to have collected 1,520 species and varieties of *Eucalyptus* and 200 species of *Casuarina*, calling the latter 'Australian pines'.

With reference to the eucalypts he remarked: 'not many more than 40 species, I believe, have been published as inhabiting the whole of Australia'. As a matter of fact, 80 perfectly good species had been described up to 1852; but doubtless the works, in which some of these appeared, were not available to Swainson. He continued thus:

Without taking too much credit to myself, I feel satisfied that these discoveries will be regarded with as much surprise, and almost incredulity, amongst the botanists of Europe as was that of gold in Australia amongst the geologists of Britain!

Sir William Hooker's 'incredulity' was expressed in a letter to Mueller, dated 9/4/1854:

If I were pleased with your report, I cannot say that I gave to our Secretary for the Colonies an equally flattering account of Mr. Swainson on the Gum Trees!!! In my life I think I never read such a series of trash and nonsense. There is a man who left this country with the character of a first-rate *naturalist* (though with many eccentricities), and he goes to Australia and takes up the subject of Botany of which he is as ignorant as a goose. I only wait for a spare page in my journal to show that he really is so. It was stated in a Sydney paper that Swainson received £800 for writing all that nonsense.

Later in the year Hooker devoted four pages of his journal to Swainson's amazing report, and summed it up neatly in one sentence:

This singular document concludes with a catalogue of Latin and English names, numbering 213 species of *Casuarinæ* . . . all new, and all named and described by Mr. Swainson 'without a single book to refer to'.